



# Alternative Proteins: Hope or Hype?

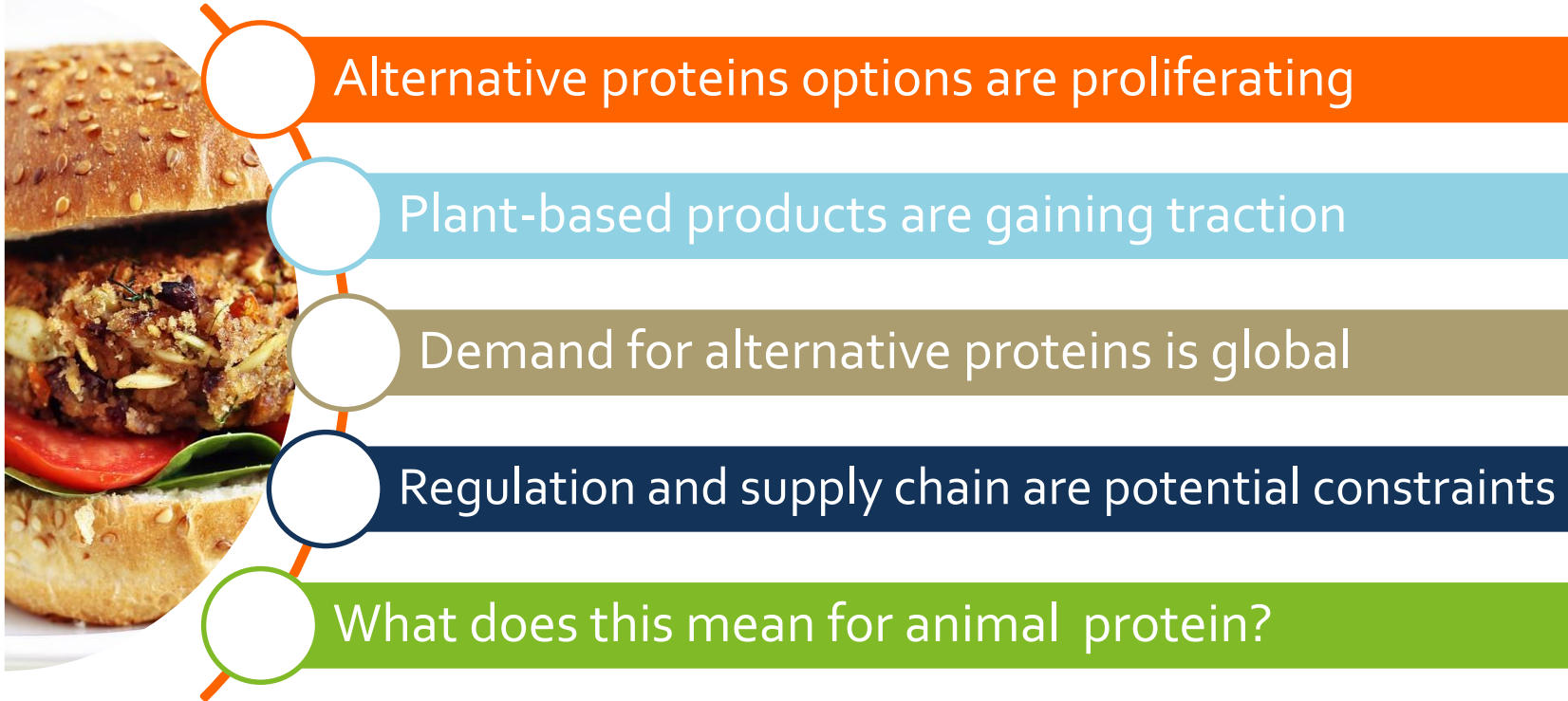
*Potential Implications for Animal Agriculture*



Christine McCracken  
Executive Director, Senior Protein Analyst  
February 21, 2019



# Alternative Protein Reaches a Tipping Point

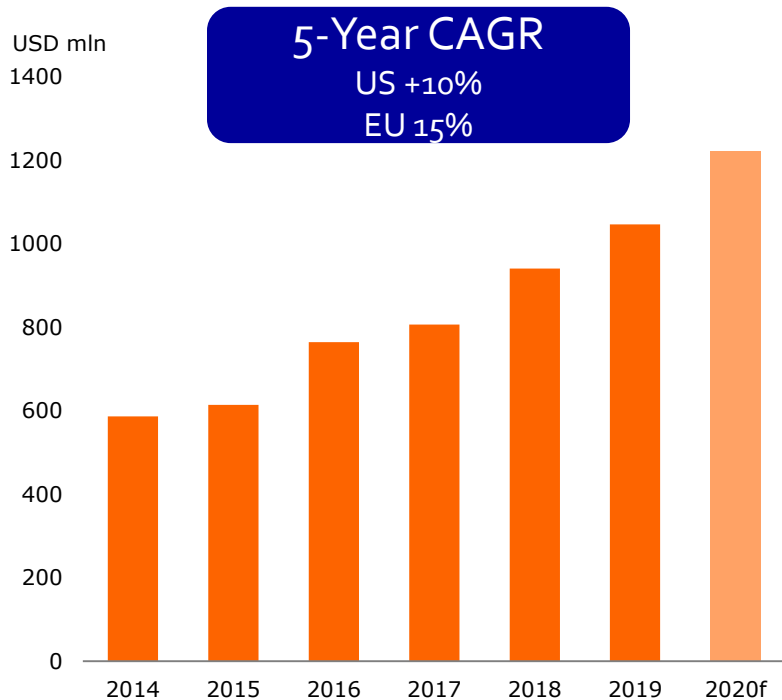


# Plant-based proteins still relatively small

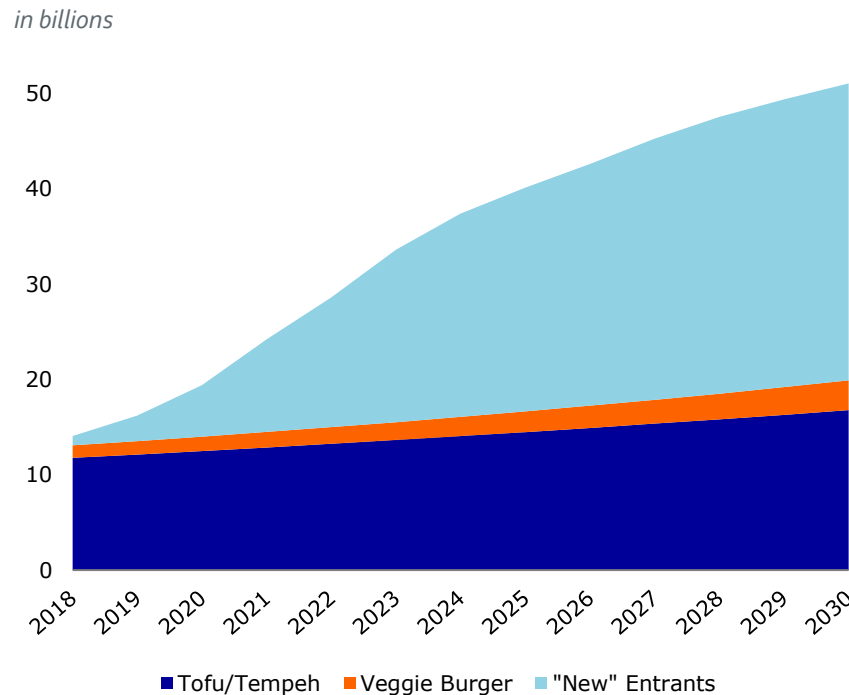


Source: Euromonitor, Rabobank 2020

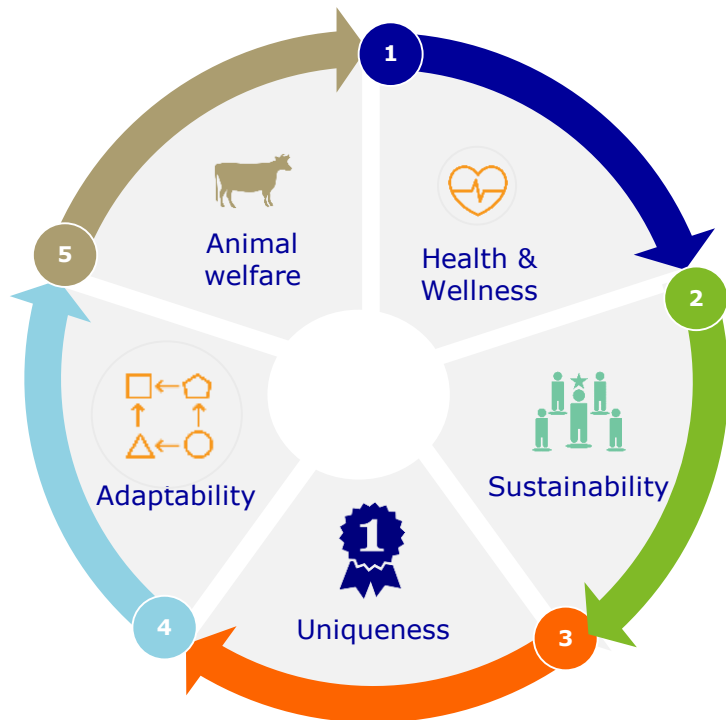
# Growth in alt proteins has been massive



Source Euromonitor, Rabobank 2019



# Multiple drivers of alt protein growth



## 1 Consumers striving to find "better-for-you" products

- Plant-based products have health halo
- Growing backlash on heavily processed items
- Next generation of products will be better

## 2 Growing interest in sustainable production

- Conflicting studies on animal footprint generate confusion
- Industry impact on water, land and air under scrutiny

## 3 Consumers looking for "new and exciting"

- Younger generations increasingly experimental
- Global market driving interest
- Influencers have changed

## 4 Consumers looking for more versatile protein options

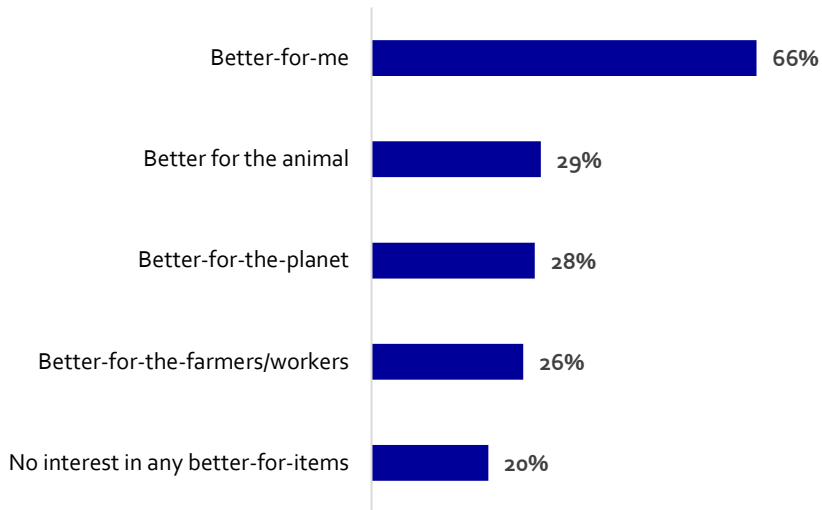
- Proteins viewed as an ingredient; not center-of-the-plate
- Ingredients tailored to meet nutritional or religious goals

## 5 Animal welfare advocates are gaining traction

- A small, but vocal minority of advocates toward veganism
- Shrinking involvement in agriculture distances consumer from source

# Health goals driving protein choices

2/3 of consumers looking for healthier protein options



*Health #1 for baby boomers*



*Environmental impact #1 for millennials*



# Battle over health is heating up

Chipotle says Beyond Meat is too processed to put in its stores -July, 2019

Whole Foods CEO says plant-based 'meat' is unhealthy -August, 2019

How ultra-processed food took over your shopping basket-February, 2020

## The New York Times

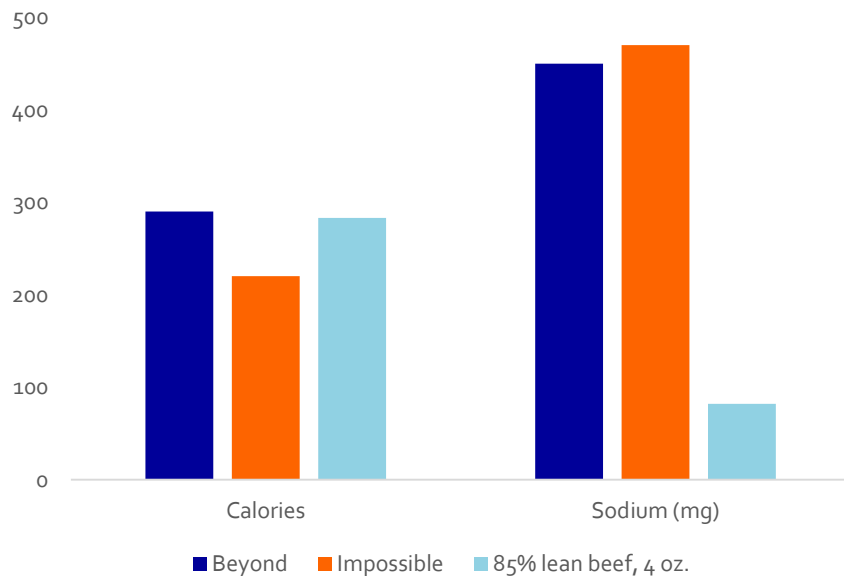
*Eat Less Red Meat, Scientists Said. Now Some Believe That Was Bad Advice.*



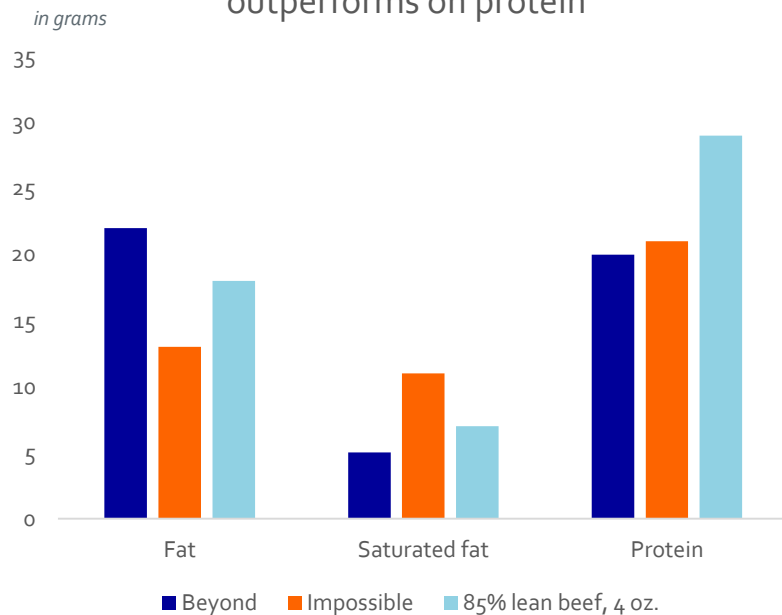
# Nutritional benefits are underwhelming



Calorie counts are similar, but sodium differences are significant

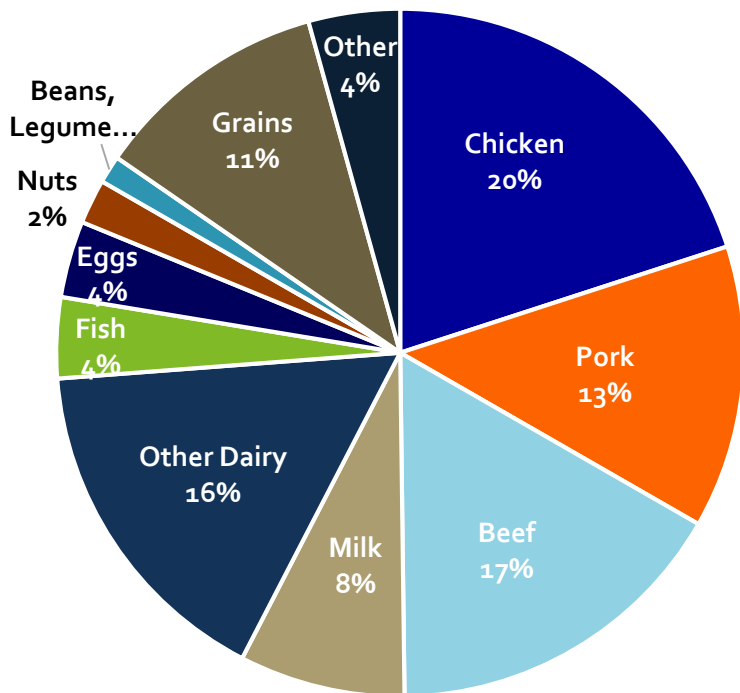


Fat levels are mixed, while beef outperforms on protein





# US consumers seeking higher protein



...yet few consumers able to identify animals as a source



45% failed to identify beef as high protein



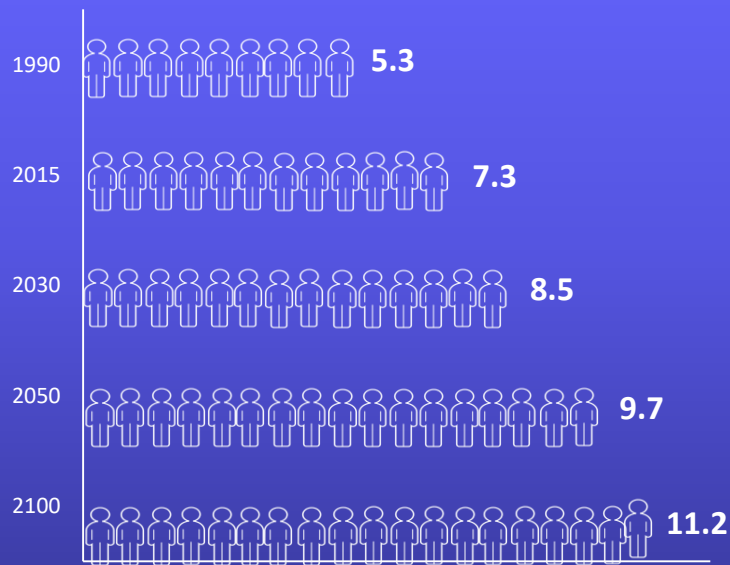
58% failed to identify chicken as high protein



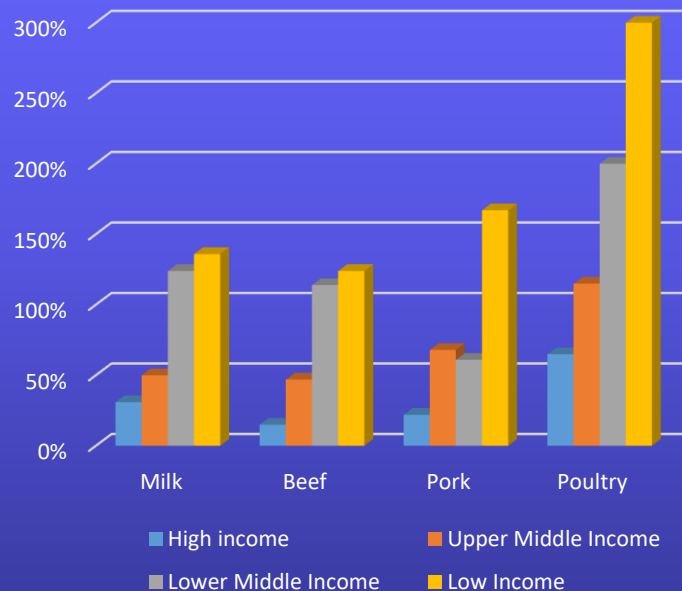
64% failed to identify pork as high protein

# Protein needs could outpace supply

## World Population Growth *in billions*



## Global Income Growth

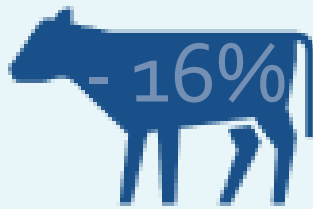
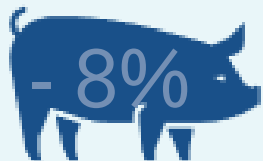


# Animal productivity gains overlooked



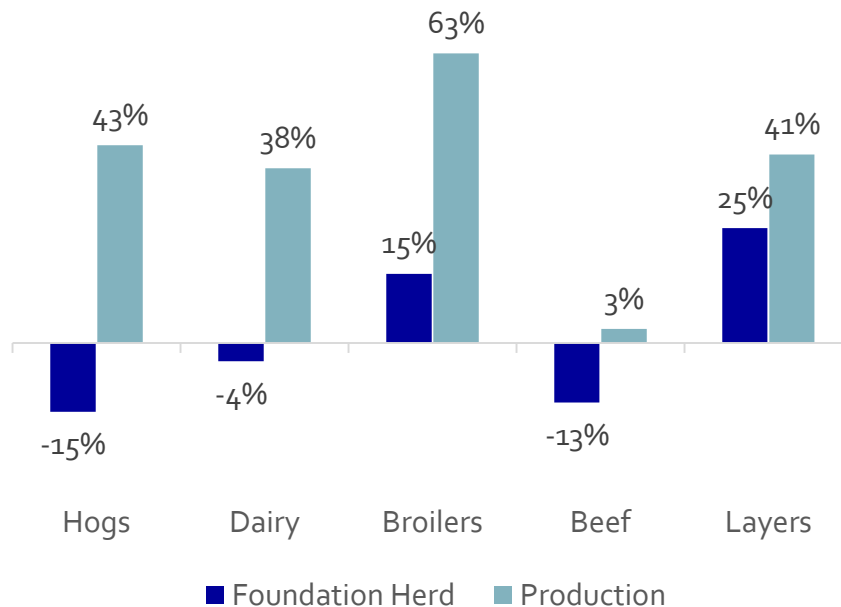
Industry water use  
**-20%**  
in 20 years

Carbon Footprint



Source: Animal Ag Alliance, Rabobank, 2019

20-year productivity change in the US

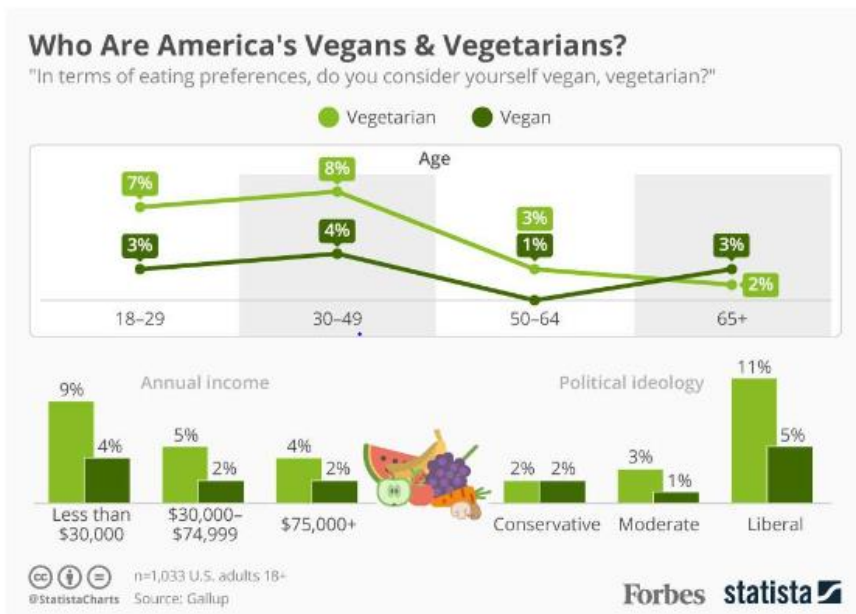




**The Future is Flexitarian**

# Flexitarians are driving alt protein trends

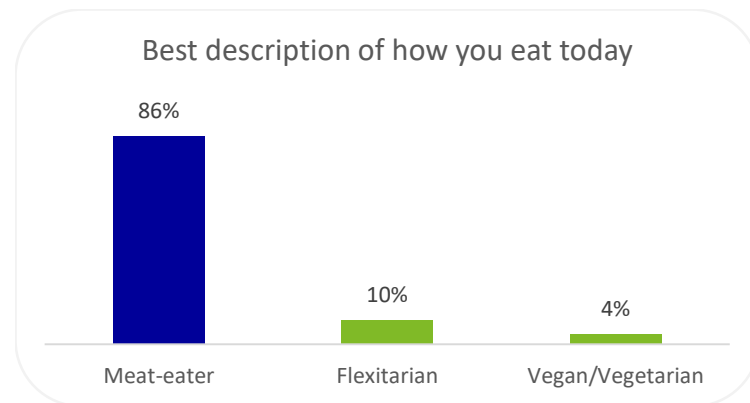
## 2019 Market Segmentation (in millions)



"In terms of eating preferences, do you consider yourself vegan, vegetarian?" STATISTA

**54%** trying to reduce their meat consumption

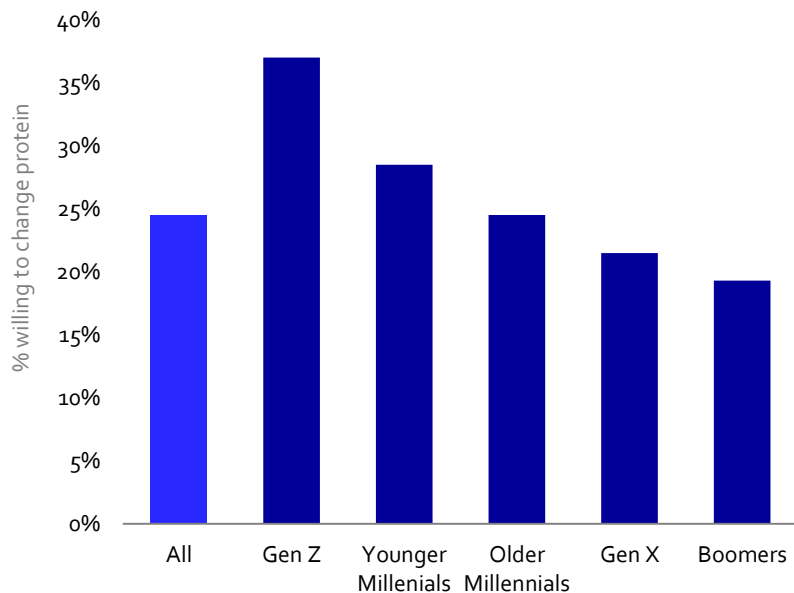
**24%** of all consumers purchased plant-based meat



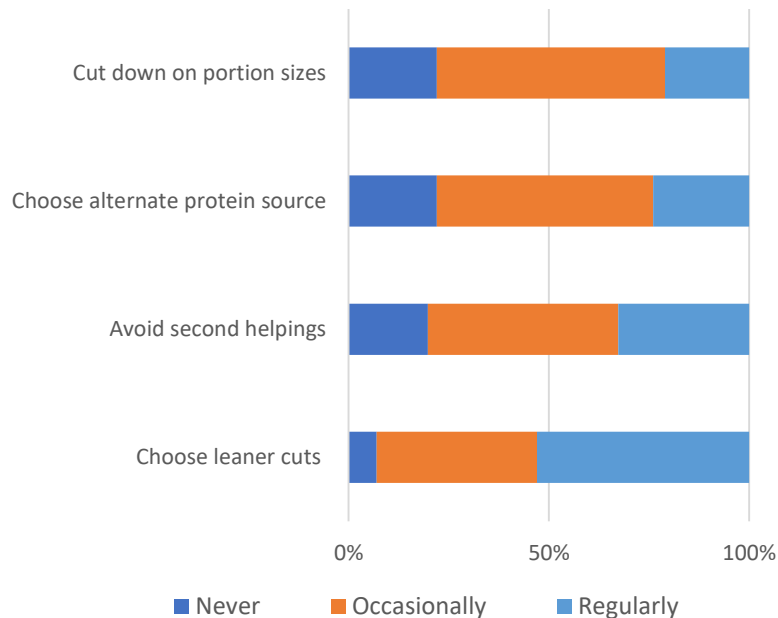
Source: Gallup, NAMI, Rabobank 2019

# Flexitarians are the target customer

## Youth more likely to change protein source

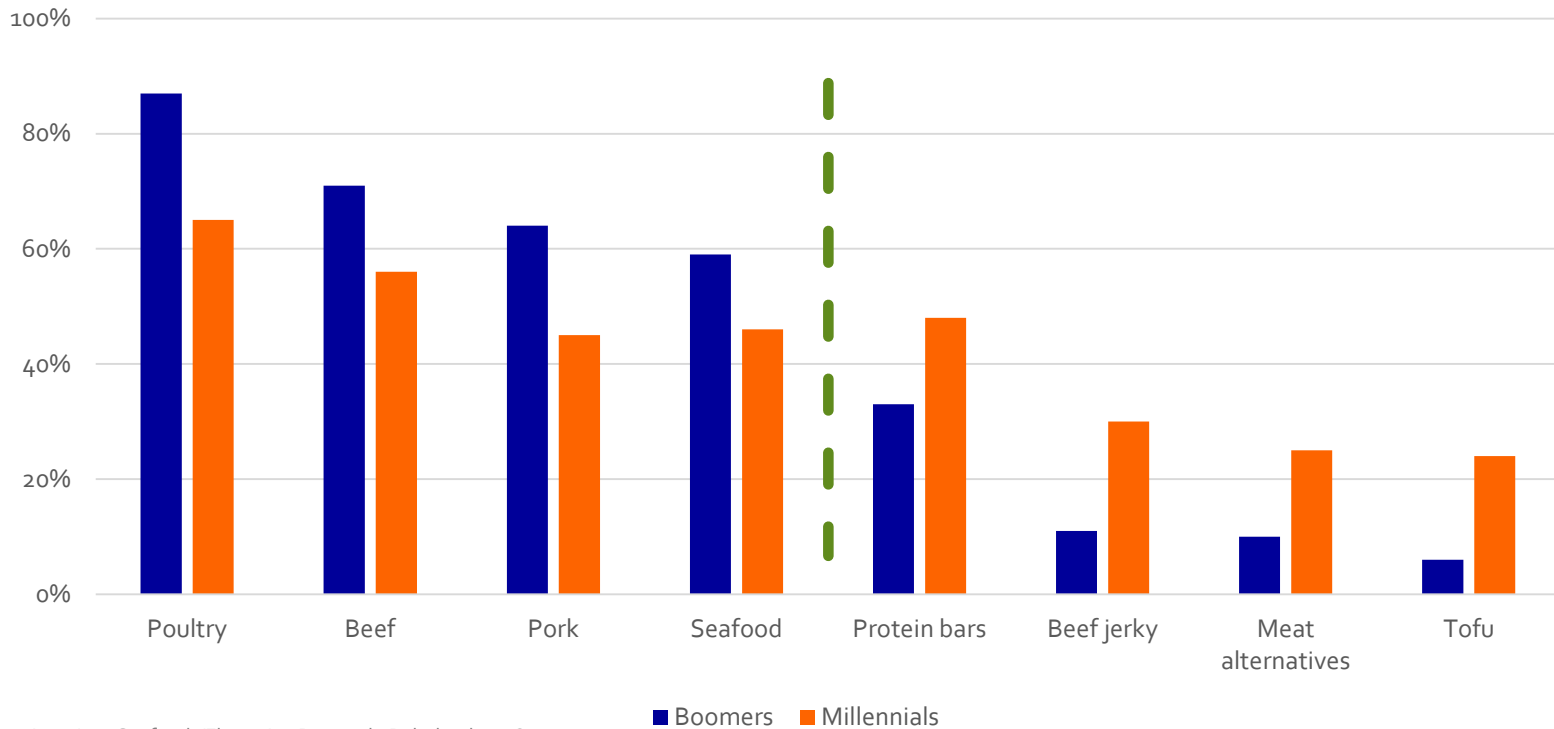


## Consumers reduce, but not eliminate animal protein



Source Euromonitor, Rabobank 2019

# Millennials favor more diverse proteins



Source: American Seafoods/Flemming Research, Rabobank 2018



# Populations likely to shift behavior



## K-12

*Inconsistent school curriculum  
Meatless Mondays  
Information from people they  
trust*



## Colleges & Universities

*More experimental  
Food availability is key  
Establishing buying patterns  
Influence each other*



## Boomers

*Less likely to shift channels  
Health-focused  
Health professionals influence  
Media and friends are key*

# Alternative proteins are slowly evolving



**Plant-Based**



**Emerging**



**Cellular Meat**

*Today*



*2030?*

# Plant-based had been a niche business



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# Plant-based now a crowded category



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# Battle of the burgers

## Options have evolved



### BEYOND MEAT™

- Pea-based protein, coconut oil, beet juice (for color)
- Both retail and foodservice
- On 6 Continents & 50 countries
- In mainstream retail incl. Kroger, Safeway, Target, Whole Foods
- Beyond Burger; Beyond Sausage & Crumbles
- Chicken strips being reformulated

### IMPOSSIBLE™

- Wheat and potato proteins, canola oil, leghemoglobin (heme) - a genetically-modified ingredient
- Product 'bleeds' like a burger
- Focused on foodservice trade
- Recently launched in retail
- Impossible Burger, Breakfast Sausage Sandwiches, Meatballs



# Go-to-market strategies differ

## Foodservice partnerships are key



Source: Company reports

# Foodservice a critical entry point

- ✓ Low cost trial
- ✓ Control and ease of preparation
- ✓ Generate buzz
- ✓ Not known for health food
- ✓ Often sell more beef when offering plant-based
- ✓ Still underpenetrated at QSR





# Retail opportunity may be more limited

- ✓ Current premium 3-4x traditional  
*more promotion needed*
- ✓ At home preparation  $\neq$  foodservice  
*more trial may be required*
- ✓ Competition will increase with new entrants  
*will help build redundancy*
- ✓ Retailers introducing private label



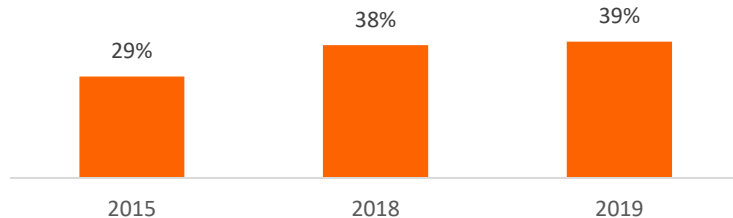
# Plant-based will over index on-line

## Meat-eaters still prefer in-store experience

### Online shopping by generation

All	39%
Younger Millennials	51%
Older Millennials	47%
Gen X	38%
Boomers	25%

Have purchased groceries online in the past year

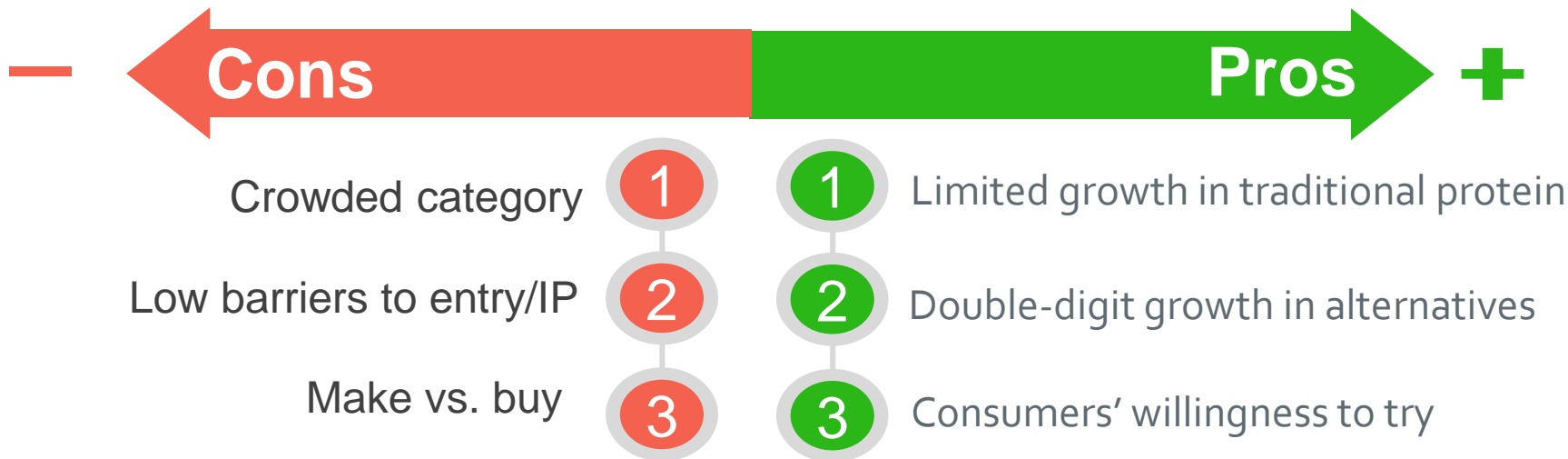


Source: NAMI, POM 2019

# How will plant “blends” factor



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# Cultivated meat coming soon-ish



Companies have “proof of concept”  
Costs lower; but not at scale

Regulation a potential constraint  
Industry not aligned on core approach

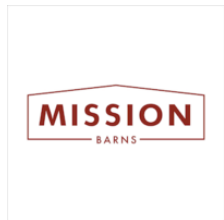
Consumer acceptance unknown  
Likely to be introduced in foodservice, minced

Environmental impacts not fully estimated  
Energy, water, & waste impact to be determined

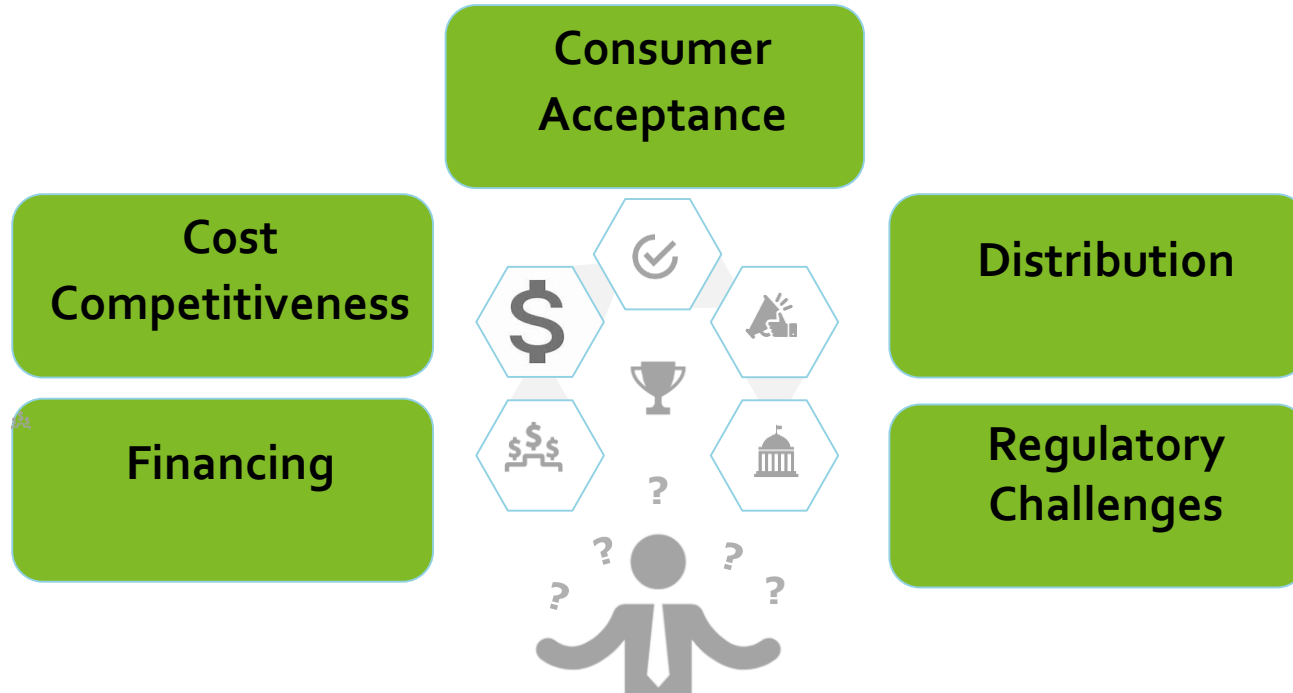
# A shorter, but growing list



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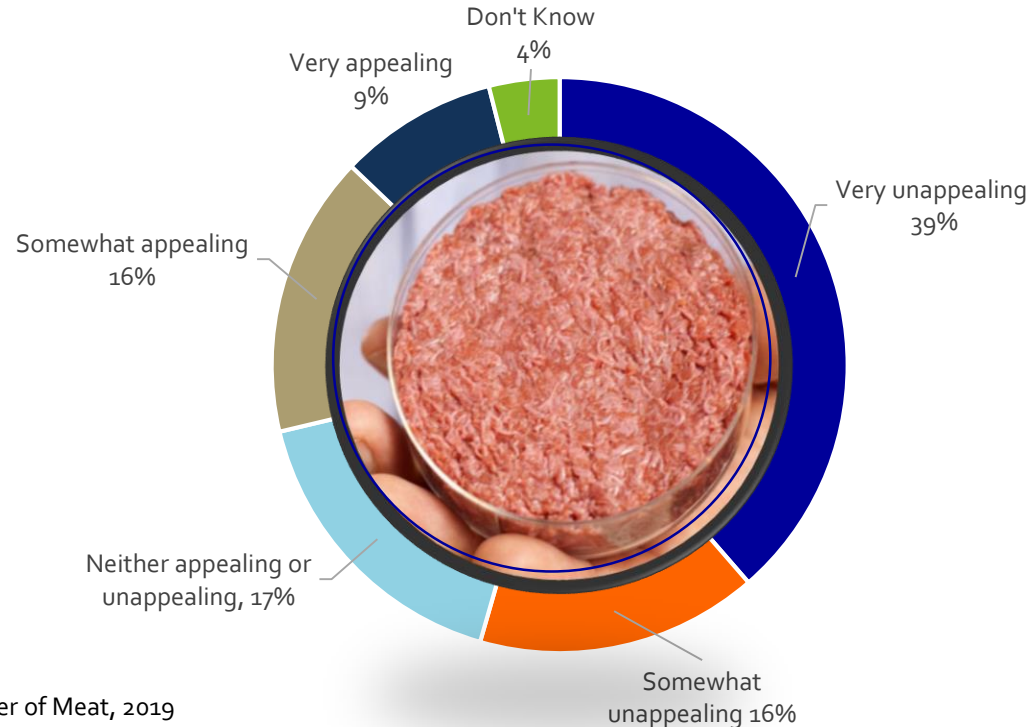


# Multiple challenges facing alt proteins



# Consumer acceptance still unclear

## Consumer Willingness to Buy Lab-based Meat



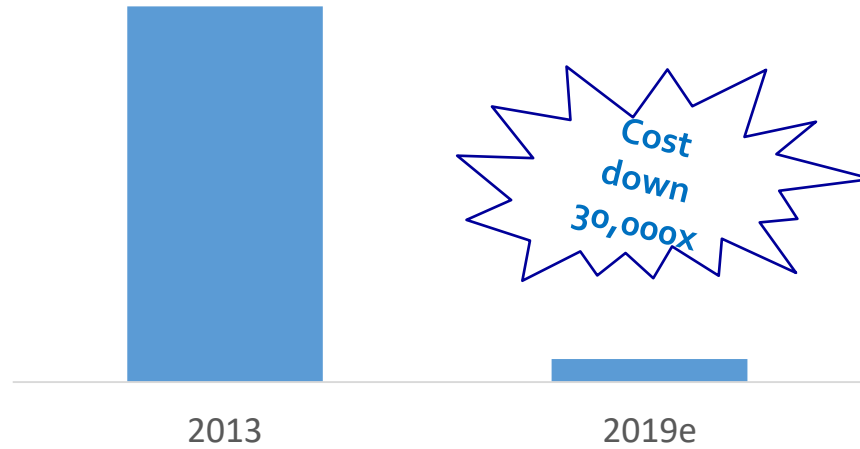
Source: NAMI, Power of Meat, 2019



# Can lab meat be cost competitive?

*The cost of a lab-grown burger has  
dropped exponentially in 5 years!*

*Cost of cultured meat, (\$/lb)*



Source: Rabobank, 2019

# Regulation is a potential disruptor

- USDA and FDA appear aligned
- Legal challenges to define “meat” at state level
- Global regulations vary
- Hard to adapt labeling for a moving target
- Industry players not always in agreement *Alliance for Meat, Poultry, & Seafood Innovation*



# What is “Meat”?



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## WHAT IS MEAT? MISSOURI IS WORKING TO LEGISLATE AGAINST LAB-GROWN ALTERNATIVES



Zaid Jilani

April 9 2018, 1:57 p.m.

## Cattlemen's group has a beef with 'fake meat'

## Got Almond Milk? Dairy Farms Protest Milk Label on Nondairy Drinks

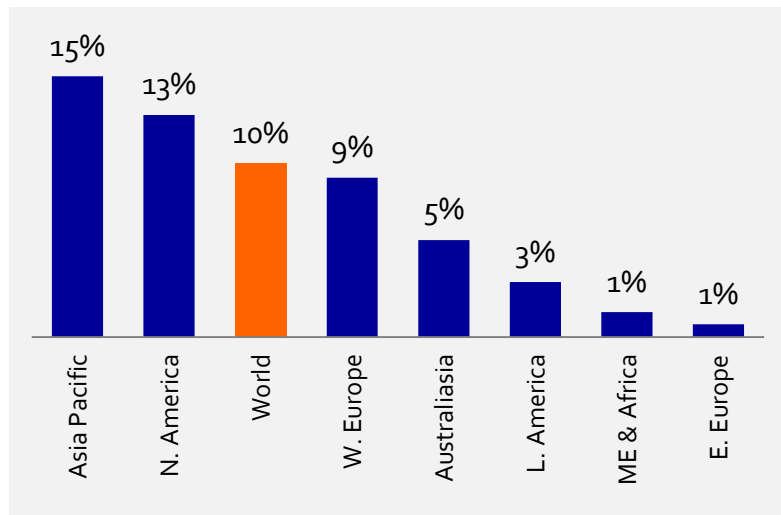
*"The reasonable consumer (indeed, even the least sophisticated consumer) does not think soymilk comes from a cow."*

**US District Judge Vince Chhabria**

## Dairy producers in a food fight over "fake milk"

# Different than plant-based milk?

## Market penetration of plant-based milk



## Fluid milk sales by market, in billions USD





76	21	178	26	5	22	19	9
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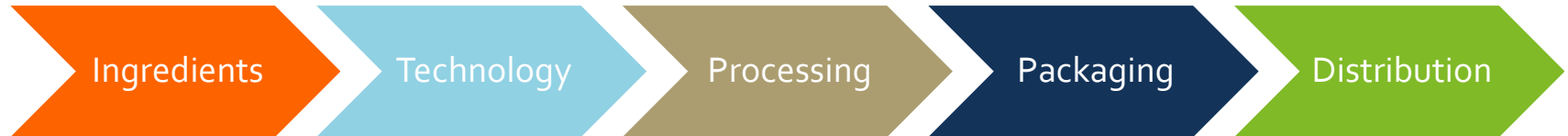
North American milk alternatives penetration  
13% dollars, 5% volume

## Lactose intolerance in global population



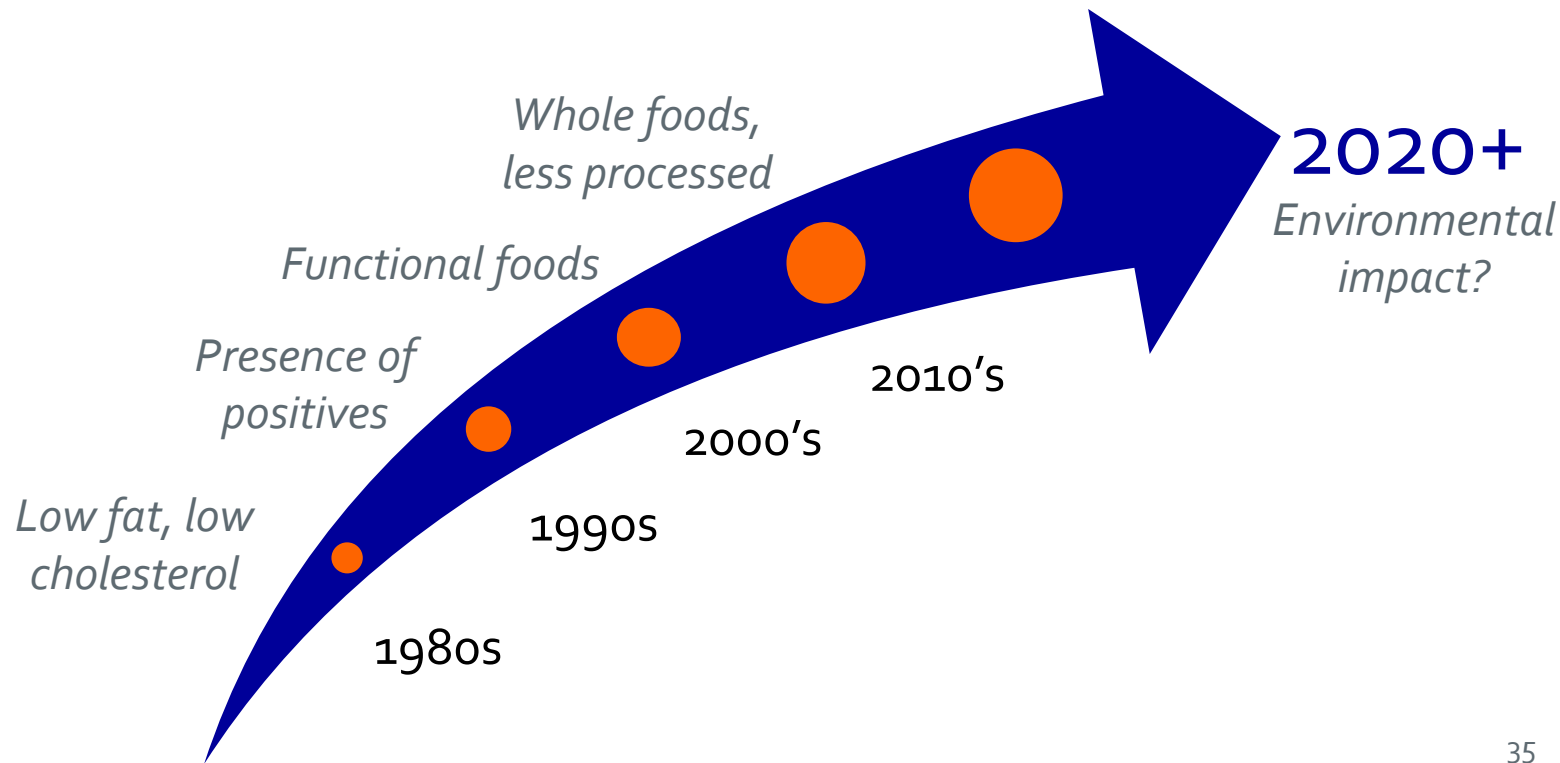
# Supply chain will be critical

 Soy	 Pea	 Mycoprotein	 Other
<ul style="list-style-type: none"><li>• Widely used</li><li>• Limited supply constraints</li><li>• US and South America</li><li>• Health-concerns (estrogen)</li><li>• GMO soy concerns</li></ul>	<ul style="list-style-type: none"><li>• Rising in popularity</li><li>• Grown in France, growing in Canada and US</li><li>• Short-term supply constraints</li><li>• Some glyphosate concerns</li></ul>	<ul style="list-style-type: none"><li>• Non-GMO fungus-based product</li><li>• Gaining in popularity</li><li>• Requires significant processing/fermentation</li><li>• Ultra - sustainable</li></ul>	<ul style="list-style-type: none"><li>• Includes mung beans, chickpeas, and lentil</li><li>• Sustainability concerns in some cases</li><li>• Supply constraints</li></ul>



# Dietary trends tend to be cyclical

Could alternative proteins have staying power or is this a fad?



# Alternative protein impact in early innings



Alternative protein products will only get better

Competition in the meat case will get more intense

Lead on health & sustainability

If you can't be them, do you join them?





# Christine McCracken

Executive Director - Senior Protein Analyst

[christine.mccracken@rabobank.com](mailto:christine.mccracken@rabobank.com)

+1 212 574 7588

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